

TAXONOMIC STUDIES IN THE GENUS *RHIPIBRUCHUS* BRIDWELL
(COLEOPTERA: BRUCHIDAE), WITH DESCRIPTIONS OF
FOUR NEW SPECIES

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Abstract.—The South American genus *Rhipibruchus* is apparently restricted to seeds of *Prosopis* spp. (Leguminosae), common name "mesquite." Six species are now assigned to it including *Rhipibruchus picturatus* (Fahraeus), *R. prosopis* Kingsolver, and four new species, *R. rugicollis*, *R. oedipygus*, *R. atratus*, and *R. psephenopygus*. Host records, geographical distribution, a key to species, and illustrations of salient characters are provided.

Since my summary of *Rhipibruchus* was published in 1967, four additional new species and numerous host associations have been discovered. In this paper the generic description is revised, new species are described, host records are tabulated, and a key to species is given. Life histories of some of these species are being investigated by Arturo Terán and Susana M. de L'Argentier in Argentina. Collections have also been made by Hugo Cordo and associates in Argentina for possible biological control of mesquite in that country and in the United States.

Genus *Rhipibruchus* Bridwell

Rhipibruchus Bridwell, 1932: 105. New name for *Megalorhipis* Philippi, 1859: 668 (not Lacordaire, 1857). Type-species: *Megalorhipis leiboldi* Philippi, 1859: 668 = *Rhipibruchus picturatus* Fahraeus, 1839: 2. Automatic type designation.

Genus in subfamily Bruchinae, tribe Acanthoscelidini. Body ovate, rather broad. Head short, broad; width across eyes approximately equal to height of head, strongly constricted behind eyes; eyes prominent, more narrowly separated in ♂ than in ♀ (Fig. 23); frons with prominent median carina expanded dorsally into triangular boss; ♂ antenna strongly pectinate from 4th segment (Fig. 16), ♀ antenna strongly serrate from 4th segment (Fig.

17). Pronotum campaniform, disk convex with narrow median sulcus separating paired basal and apical tumescences, or pronotum uniformly convex without prominent tumescences; median basal lobe rounded, lateral margins slightly convex or sinuate; lateral carina obsolete or faintly indicated by threadlike line. Scutellum small, narrow. Elytra subquadrate, each elytron evenly rounded at apex; disk flat, or subdepressed medially; striae usually well defined, 3rd and 4th striae commonly arising at base from prominent, rounded, bidentate gibbosity. Pro- and mesolegs slender, procoxae contiguous apically, mesocoxae narrowly separated; metafemur moderately incrassate, finely serrate in basal $\frac{2}{3}$ on ventroposterior margin, pecten with 3 or 4 denticles (Fig. 24). Male pygidium arcuate in lateral profile, apex fitting into emargination of 5th sternum; sterna 2-5 telescoped; ♀ pygidium nearly flat in lateral profile, vertical or oblique. Male genitalia with median lobe long and slender (Fig. 2); lateral lobes elongated, slightly expanded apically (Fig. 3).

The male genitalia in the six known species of *Rhipibruchus* (and one species of *Pectinibruchus* Kingsolver, a closely related genus) are basically similar with only subtle specific differences; however, the basic structure is so unlike that of any other species or group of species that for future reference in relating *Rhipibruchus* and *Pectinibruchus* to other groups, the following description is given (Fig. 10): The median lobe is elongated, parallel-sided in apical two-thirds but cucullate in basal one-third; the ventral valve is ovate-acuminate and varies but little throughout the genus. Details of the armature of the internal sac are:

1. A pair of acute, obliquely positioned transparent plates with their apices extending into apical orifice: the surfaces of the plates appear to be minutely pitted perhaps with glandular openings but the shape of the plate does not vary to supply specific differences except in *R. picturatus*.

2. A transparent plate bearing 3-6 spines on its dorsal face: the shape of this plate and the number of spines is diagnostic.

3. A cluster of setae resembling a brush: length and shape of the brush is diagnostic.

4. A cluster of thornlike spines or denticles: the shape, number, and relative number of spines is diagnostic.

5. A saclike structure near apex of internal sac carrying two rodlike sclerites; not diagnostic.

The lateral lobes are not strikingly different among the species, the principal diagnostic features being the length of the lobes, shape of the apex of each lobe, and the depth of the cleft between them.

Color and pattern of the pronotum and pygidium are fairly consistent for each species but the pattern on the elytra is somewhat variable and must be used with caution in concert with other characters.

Table 1. *Rhipibruchus* species and their *Prosopis* host plants.

<i>Rhipibruchus</i> Species	<i>Prosopis</i> Species
<i>R. atratus</i>	<i>P. abbreviata</i> Benth.; <i>P. alba</i> Griseb.; <i>P. caldenia</i> Burkart; <i>P. flexuosa</i> DC.; <i>P. nigra</i> (Griseb.) Hieron.; <i>P. ruscifolia</i> Griseb.; <i>P. torquata</i> (Lag.) DC.
<i>R. oedipygus</i>	<i>P. kuntzei</i> Harms.
<i>R. picturatus</i>	<i>P. alba</i> ; <i>P. affinis</i> Spreng.; <i>P. caldenia</i> ; <i>P. chilensis</i> (Mol.) Stuntz; <i>P. elata</i> (Burk.) Burk.; <i>P. ferox</i> Griseb.; <i>P. flexuosa</i> ; <i>P. humilis</i> Hook. & Arn.; <i>P. nigra</i> ; <i>P. strombulifera</i> (Lam.) Benth.; <i>P. torquata</i> .
<i>R. prosopis</i>	<i>P. affinis</i> Spreng.; <i>P. alpataco</i> Phil.; <i>P. calingastana</i> Burk.; <i>P. chilensis</i> ; <i>P. juliflora</i> (Sw.) DC.; <i>P. kuntzei</i> ; <i>P. nigra</i> ; <i>P. sericantha</i> Hook. & Arn.; <i>P. strombulifera</i> .
<i>R. psephenopygus</i>	<i>P. alba</i> ; <i>P. alpataco</i> ; <i>P. caldenia</i> ; <i>P. chilensis</i> ; <i>P. flexuosa</i> ; <i>P. juliflora</i> ; <i>P. nigra</i> ; <i>P. torquata</i> .
<i>R. rugicollis</i>	<i>P. kuntzei</i> ; <i>P. sericantha</i> .

Species in this genus are so far known to breed only in seeds of various species of *Prosopis* L. (Leguminosae) (mesquite, algarrobo, algarobillo). *Rhipibruchus* is restricted to South America principally in north and central Argentina and Chile but records from Uruguay and a questionable record from Colombia are known. Host species and their associated bruchids are listed in Tables 1 and 2.

Rhipibruchus is closely related to *Pectinibruchus* Kingsolver but the affinities of these genera remain obscure. The South American genus *Pseudopachymerina* superficially resembles *Rhipibruchus* but I believe that they are only remotely related. The male genitalia of *Pseudopachymerina* are quite different from those of *Rhipibruchus* in basic structure; the metafemur is broader than in *Rhipibruchus*; the antenna is not sexually dimorphic as it is in *Rhipibruchus*; and the basal denticles of the third and fourth elytral striae are not elevated on a tumescence.

Rhipibruchus is tentatively separated into three groups primarily on the basis of body form and color pattern, (1) the *rugicollis* group including only *rugicollis*; (2) the *oedipygus* group including only *oedipygus*; and (3) the *picturatus* group including *picturatus*, *prosopis*, *atratus*, and *psephenopygus*.

KEY TO SPECIES OF *RHIPIBRUCHUS*

1. Body large, 3.6–5.4 mm in length; with no distinct pattern on pronotum, elytra, or pygidium; vestiture mostly gray with pronotum and elytra with mixed gray and bronze; pronotum (Fig. 7) without prom-

Table 2. *Prosopis* species and their *Rhipibruchus* predators.

<i>Prosopis</i> Species	<i>Rhipibruchus</i> Species
<i>P. abbreviata</i>	<i>R. atratus</i>
<i>P. affinis</i>	<i>R. picturatus</i>
<i>P. alba</i>	<i>R. atratus</i> ; <i>R. picturatus</i> ; <i>R. psephenopygus</i>
<i>P. algarobilla</i>	<i>R. picturatus</i> (literature record, Bosq, 1942) = <i>P. affinis</i>
<i>P. alataco</i>	<i>R. prosopis</i> ; <i>R. psephenopygus</i>
<i>P. caldenia</i>	<i>R. atratus</i> ; <i>R. picturatus</i> ; <i>R. psephenopygus</i>
<i>P. calingastana</i>	<i>R. prosopis</i>
<i>P. chilensis</i>	<i>R. picturatus</i> ; <i>R. prosopis</i> ; <i>R. psephenopygus</i>
<i>P. elata</i>	<i>R. picturatus</i>
<i>P. ferox</i>	<i>R. picturatus</i>
<i>P. flexuosa</i>	<i>R. atratus</i> ; <i>R. picturatus</i> ; <i>R. prosopis</i> ; <i>R. psephenopygus</i>
<i>P. humilis</i>	<i>R. picturatus</i> (literature record, Bosq, 1942)
<i>P. juliflora</i>	<i>R. prosopis</i> ; <i>R. psephenopygus</i>
<i>P. kuntzei</i>	<i>R. oedipygus</i> ; <i>R. prosopis</i> ; <i>R. rugicollis</i>
<i>P. nigra</i>	<i>R. atratus</i> ; <i>R. picturatus</i> ; <i>R. prosopis</i> ; <i>R. psephenopygus</i>
<i>P. ruscifolia</i>	<i>R. atratus</i>
<i>P. sericantha</i>	<i>R. prosopis</i> ; <i>R. rugicollis</i>
<i>P. silaquastrum</i>	<i>R. picturatus</i> (literature record, Zacher, 1952) = <i>P. chilensis</i>
<i>P. strombulifera</i>	<i>R. picturatus</i> ; <i>R. prosopis</i>
<i>P. torquata</i>	<i>R. atratus</i> ; <i>R. picturatus</i> ; <i>R. psephenopygus</i>

- inent median tumescences but with subbasal tumescences
 *oedipygus*, new species
- Body large or small; usually with pattern on dorsal surfaces, color mixed; pronotum with longitudinal tumescences adjacent to midline; sub-basal tumescences prominent 2
2. Pronotum in lateral aspect with dorsal profile strongly sinuate (Fig. 6); elytra without strongly contrasting pattern (Fig. 1); pygidium with short, narrow, white basal triangle and small tuft of white either side at basal $\frac{1}{3}$ (Figs. 4, 5) *rugicollis*, new species
- Pronotum in lateral aspect with dorsal profile only slightly sinuate (Fig. 18); elytra and pygidium usually with contrasting pattern 3
3. Antenna strongly pectinate (Fig. 16); eyes narrowly separated by frons (Fig. 23, ♂); pygidium with faint sublateral depressions (Fig. 28); male 4
- Antenna serrate (Fig. 17); eyes more widely separated by frons (Fig. 23, ♀); pygidium with prominent sublateral depressions often contrastingly marked in integument and vestiture (Fig. 29); female 7
4. Pygidium with integument uniformly dark brown to black with at most a narrow reddish-yellow stripe from middle of disk to apex, vestiture sparse, evenly distributed (Fig. 33)
 *psephenopygus*, new species

- Pygidial integument with extensive yellowish to yellowish-red areas, vestiture usually in dense patches (Fig. 28) 5
- 5. Pronotum mostly piceous with contrasting narrow, white basal patch of setae and narrow median line, rarely with cruciate mark in middle of disk (Fig. 25); elytra with lateral and apical margins broadly black, median area of disk with 2-4 isolated dark spots but without large median, common discal spot, or broad, transverse band (Fig. 25) *atratus*, new species
- Pronotal disk piceous with flanks and cruciate median mark gray; elytra with margins usually mottled or streaked with longitudinal spots, median area usually with large discal spot or continuous or broken band (Figs. 12, 19, 30) 6
- 6. Vestiture and integument of basal 1/3 of elytra yellowish, middle of elytra usually with large, common discal spot (Fig. 19), occasionally with transverse band; male genitalia with transparent plates at apical orifice elongated (Fig. 21) *prosopis* Kingsolver
- Vestiture of basal 1/3 of elytra gray; middle of elytra occasionally with discontinuous transverse dark band but never with discal spot (Fig. 12); male genitalia with transparent plates short and broad (Fig. 14) *picturatus* (Fahraeus)
- 7. Apical 1/5 of elytra largely black, occasionally with paler elongate spot on 7th interval (Fig. 25); pygidium with strongly contrasting black or piceous sublateral depressions, these separated by median, white stripe (Fig. 29) *atratus*, new species
- Apices of elytra variegated black and yellowish brown (Figs. 12, 19, 30); pygidium with contrasting spots or these obscure (Figs. 13, 20, 34) 8
- 8. Pygidial integument uniformly piceous with at most a reddish stripe from middle of pygidium to apex (Fig. 34); sublateral spots obscure *psephenopygus*, new species
- Pygidial integument with contrasting dark sublateral spots (Figs. 13, 20) 9
- 9. Pygidium with basal triangle and short median stripe white, remaining vestiture yellowish, lateral spots piceous or black (Fig. 20) ...
- *prosopis* Kingsolver
- Pygidial vestiture silvery gray, basal triangle and "eyebrow" spots above sublateral black or piceous spots appearing more intensely white than intervening areas (Fig. 13) *picturatus* (Fahraeus)

RUGICOLLIS GROUP

Pronotum with prominent medial and subbasal tumescences; elytra and pygidium with mottled pattern; pygidium not sexually dimorphic and without darkened depressions in female.

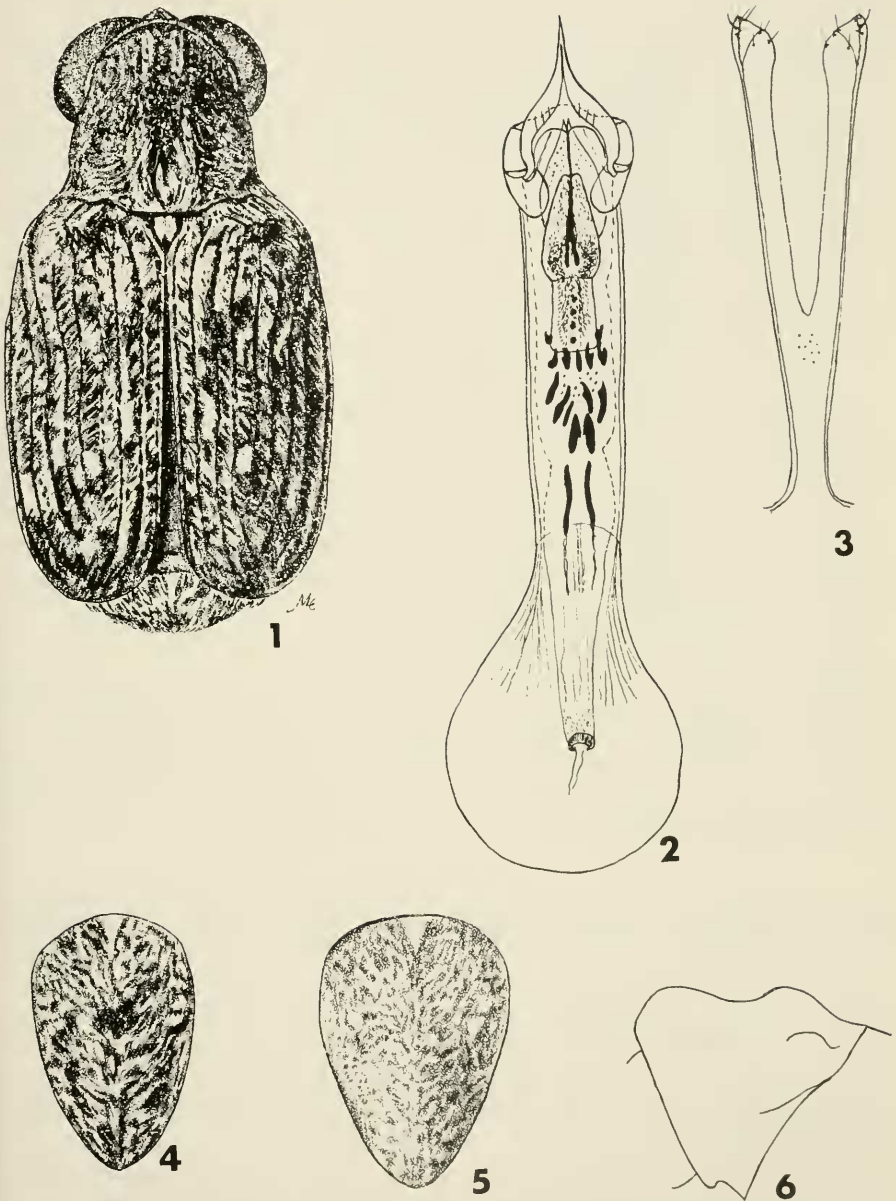
Rhipibruchus rugicollis Kingsolver, NEW SPECIES

Figs. 1-6, 38

Body length.—3.9–4.4 mm; width, 2.1–2.3 mm. Pronotal length, 1.3–1.5 mm; width, 1.4–1.6 mm.

Color.—Integument dark red to piceous, without distinct pattern; head piceous except eyes black, spot above each eye reddish; antenna uniformly piceous; pronotum, elytra, pygidium, and venter of body uniformly piceous except metacoxa reddish, metafemur darker in ventral $\frac{1}{2}$. Vestiture of gray and yellowish hairs in mottled pattern on both dorsal and ventral surfaces (Fig. 1); pygidium mottled with hairs obliquely positioned toward midline, with short basal triangle and 2 small lateral clumps of white hairs (Figs. 4, 5).

Structure.—Body elongated; pronotum campaniform; elytra rectangular, together slightly longer than wide. Head obovate, eyes strongly protuberant laterally, vertex finely, densely punctate, frons strongly carinate in both sexes, narrower in δ than in ♀ , slopes of carina punctulate, clypeus micro-rugose, postocular fringe narrow. Pronotum (Figs. 1, 6) with lateral margins sinuate; longitudinal, median, undulate elevation broadly sulcate, sublateral gibbositities prominent; surface of pronotum densely foveolate, each foveola setiferous; lateral carina traceable from posterolateral corner to a point immediately above procoxal cavity; cervical sulcus fine, short; cervical boss prominent, bisetiferous; prosternum short, intercoxal piece extending $\frac{1}{2}$ length of coxae; mesosternum narrow, triangular; postmesocoxal sulci meeting on midline, fine, parallel to coxal cavity. Scutellum elongate, $2\times$ as long as wide, bidentate apically, densely pilose. Elytra elongate (Fig. 1), gently convex but subdepressed along suture and basally between 3rd intervals; striae fairly regular in course except 3rd and 4th bent laterally at base, shallowly sulcate, punctures elongate, setiferous; 1st stria arising near scutellar apex, 2nd arising behind vertical basal ridge, 3rd and 4th arising from fine denticles on summit of prominent subbasal gibbosity, 5th arising on lateral limits of gibbosity; all striae free apically, 4th and 5th abbreviated; intervals flat, strigulate, densely setose. Abdomen of δ strongly telescoped, length of segments 2–5 less than that of 1st segment, 5th segment with posterior border emarginate for reception of apex of pygidium; pygidium elongate and narrowly triangular, basal margin arcuate, surface convex, densely, evenly microfoveolate; abdomen of ♀ with segments 2–5 together slightly longer than 1st segment, 5th segment with posterior margin evenly rounded; pygidium (Figs. 4, 5) elongate-obovate, oblique, surface convex, shallowly impressed sublaterally toward apex, surface densely microfoveolate. Pro- and mesolegs not modified; metacoxa densely, finely punctate except for elongate, polished proximal area; metafemur moderately incrasate, dorsal margin evenly arcuate, ventral margin arcuate in basal $\frac{4}{5}$,



Figs. 1-6. *Rhipibruchus rugicollis*. 1. Habitus, dorsal. 2. ♂ genitalia, median lobe. 3. ♂ genitalia, lateral lobes. 4. Pygidium ♂. 5. Pygidium ♀. 6. Prothorax, lateral profile.

sinuate apically, pecten with 1 long and 3 shorter denticles on its distal slope; metatibia slender, more narrowed proximally and gradually widened distally, mucro short, acute, lateral denticle short, coronal denticles 3 or 4; lateral, ventral and dorsomedial carinae distinct and complete to apex, lateroventral carina obsolete in apical 4/5. Male genitalia (Figs. 2, 3) with internal sac of median lobe with brush of setae inconspicuous, poorly defined; spinous plate elongate, with 4–5 spines; median cluster of 12–15 thorn-like or sickle shaped denticles. Lateral lobes with apices oblique, cleft to about $\frac{2}{3}$ their length.

Holotype ♂.—ARGENTINA: Salta Prov., Tartagal, December 1950, Daquerre (USNMNH type #76390).

Allotype ♀ and 6 ♂, 3 ♀ paratypes.—ARGENTINA; Santiago del Estero Prov., Termes de Rio Hondo, 20 April 1972, ex *Prosopis sericantha*.

Other paratypes.—ARGENTINA: Tucumán Prov., Tucumán, 1941, J. Hayward, 4 ♂, 2 ♀. Formosa Prov., Rt. 81, 14 mi SE Cdte. Fontana, 12 March 1977, ex *Prosopis kuntzei*, 1 ♂, 1 ♀; Rt. 81, 58 mi SE Ing. Juarez, 11 March 1977, ex *Prosopis kuntzei*, 1 ♀. Chaco Prov., in "itin" (*Prosopis kuntzei*), 1 ♂, 1 ♀; Chaco, ex *Prosopis kuntzei*, 1 ♂, 1 ♀. Paratypes deposited in the National Museum of Natural History, Washington, D.C. (USNMNH), the Fundación Miguel Lillo, Tucumán, and Bernadino Rivadavia Museum of Natural Sciences, Buenos Aires, Argentina.

Discussion.—This species is easily recognized by the prominent medial tumescences, the mottled pattern on the elytra and pygidium, the lack of darkened depressions on the female pygidium, and the larger size.

Remarks.—The name *rugicollis* is derived from the Latin *ruga* (wrinkled) and *collum* (neck) and refers to the rugose pronotum. In Kingsolver et al. (1977: 115), *R. rugicollis* was listed as *R. sp. D*.

OEDIPYGUS GROUP

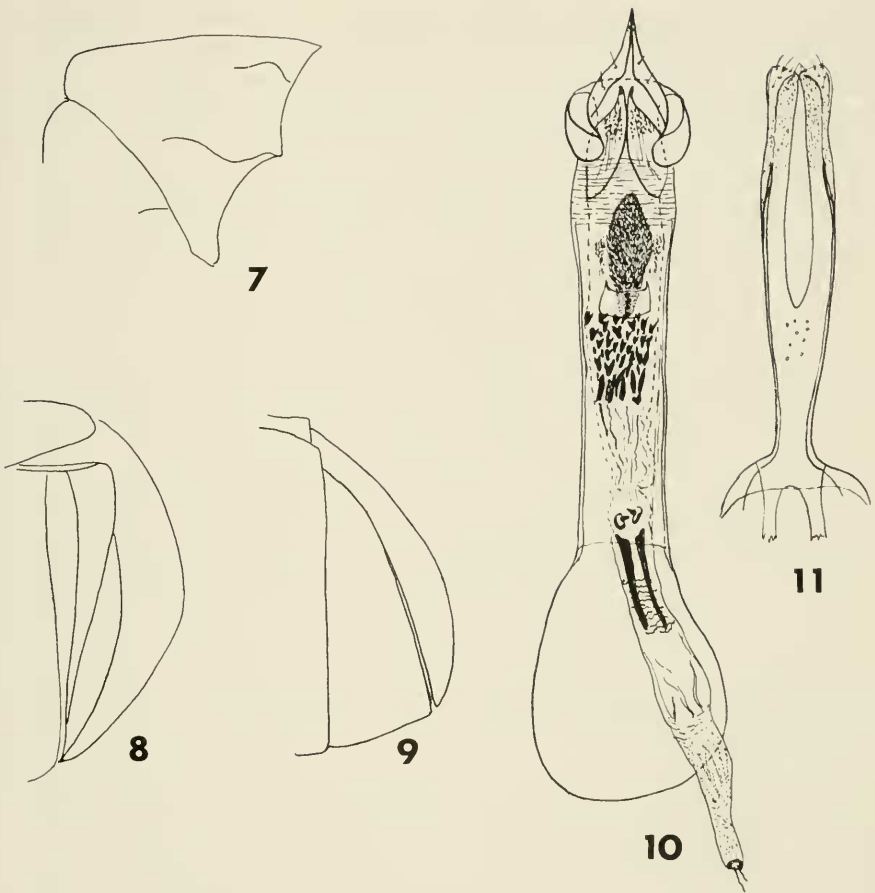
Pronotum convex, without medial but with subbasal tumescences; elytra and pygidium with vestiture evenly distributed, not sexually dimorphic, without darkened depressions in female.

Rhipibruchus oedipygus Kingsolver, NEW SPECIES

Figs. 7–11, 38

Body length.—3.6–5.4 mm; width, 2.0–2.6 mm. Pronotal length, 1.8–2.0 mm; width, 2.0–2.5 mm.

Color.—Integument mostly piceous with following areas reddish: triangular spot above eye, lateral margin of pronotum, posterior $\frac{1}{3}$ of metasternum, abdominal sterna, pro- and mesofemora, dorsal $\frac{1}{2}$ of metafemur, metatibia; with following areas yellowish red: antenna with rami darker in ♂, pro- and mesotibiae. Vestiture of intermixed gray and bronze slender hairs



Figs. 7-11. *Rhipibruchus oedipygus*. 7. Prothorax, lateral profile. 8. Pygidium ♂, lateral profile. 9. Pygidium ♀, lateral profile. 10. ♂ genitalia, median lobe. 11. ♂ genitalia, lateral lobes.

evenly distributed over body, elytra with predominantly bronze vestiture, remainder of body predominantly gray with bronze setae set in foveolae.

Structure.—Body elongate, head subtriangular, eyes strongly protuberant, nearly divided by ocular sinus with about 7 rows of facets between sinus and posterior margin of eye, supraocular sulcus with setiferous, umbilicate punctures; vertex densely foveolate posteriorly, with subtriangular, minutely granulate boss anteriorly leading to frontal carina, frons foveolate on lateral slopes, narrower in ♂ (width across eyes: narrowest frontal width 7:1) than in ♀ (4:1); clypeus broadly concave, shallowly foveolate, densely setose; labrum finely granulate; ♂ antenna with scape cucumiform, pedicel

short, 1st flagellar segment angular, 2nd with short ramus, remaining segments each with long, setose ramus; ♀ antenna serrate from 4th segment. Pronotum campaniform, apex evenly arcuate, lateral margins moderately sinuate, posterolateral angles slightly flared, basal margin sinuate, basal lobe prominent, prominent condyle near basal margin either side of basal lobe; in lateral aspect, dorsal profile nearly flat in basal $\frac{4}{5}$, strongly convex at apex; surface densely, evenly foveolate, each foveola bearing short, bronze seta; lateral carina short (Fig. 7); cervical sulcus short, obscure, cervical boss with 3–5 setae; prosternum short, triangular, not separating procoxae apically; mesosternum narrow, rounded and slightly sulcate at apex; post-mesocoxal sulcus absent. Scutellum $1\frac{1}{2}\times$ as long as wide, apex shallowly emarginate, bidentate. Elytra slightly longer than wide, evenly convex; striae uniform, evenly spaced, shallowly sulcate, foveolate, well marked in medial $\frac{1}{2}$, partly to completely obliterated laterally, especially in basal $\frac{1}{2}$, sutural stria deep, narrow, 2nd stria arising basally from deep pit beneath marginal bead, 3rd and 4th arising from prominent bidentate basal gibbosity, 5th on lateral margin of gibbosity, bases of remaining discal striae obliterated in imbricate caudal extension of humeral umbo, striae free apically with 4th and 5th abbreviated and approximate; intervals finely imbricate and foveolate, especially toward base. Abdomen with basal sternum $2\times$ as long as 5th sternum in ♂, subequal in length in ♀, caudal margin of 5th deeply emarginate for reception of apex of pygidium in ♂, evenly rounded in ♀; pygidium obovate in caudal aspect in both sexes, strongly convex in ♂ (Fig. 8), only slightly convex in ♀ (Fig. 9) in lateral aspect, apex of pygidium fitting into emarginate 5th sternum, ♀ pygidium nearly vertical, disk in both sexes densely, evenly, shallowly foveolate, foveolae nearly concealed by dense vestiture. Pro- and mesolegs not modified; metacoxa finely, densely punctate except for anterior polished area; metafemur moderately incrassate, pecten with 1 large and 2 small denticles; metatibia slender, mucro short, acute; lateral, ventral, and dorsomedial carinae distinct and complete, lateroventral carina obsolete in apical $\frac{1}{3}$.

Male genitalia (Figs. 10, 11).—Internal sac of median lobe with brush of setae short; spinous plate small with 5 spines; median cluster of about 40 small denticles; lateral lobes rounded apically, cleft to about $\frac{1}{2}$ their length.

Holotype ♂.—ARGENTINA: Chaco, ex seed of *Prosopis kuntzei*, Harms, #1365. In collection of Fundación Miguel Lillo, Tucumán, Argentina.

Allotype ♀.—ARGENTINA: Tucumán, 1941, J. Hayward; on temporary loan to the National Museum of Natural History, Washington, D.C.

Other paratypes.—ARGENTINA: Formosa Prov., Rio Bermejo (Pto. Lavalle), 23 August 1972, ex seeds *Prosopis kuntzei*, 2 ♂, 3 ♀; Ibarreta, 8 April 1976, ex seeds "itin" (*Prosopis kuntzei*) 2 ♂. Santiago del Estero Prov., north of the city, July 1965, ex seeds *Prosopis kuntzei*, 2 ♂.

Diagnosis.—This distinctive species differs from *R. prosopis*, *R. picturatus*, *R. atratus*, and *R. psephenopygus* by the absence of a distinct color pattern, its larger size, strongly convex ♂ pygidium, and details of the ♂ genitalia. It differs from *R. rugicollis* by its color, lack of median pronotal tumescences, color patterns of the ♂ and ♀ pygidia, and details of the ♂ genitalia.

Remarks.—The name *oedipygus* is derived from the Greek *oidema* (swelling) and *pyge* (rump) and refers to the bulbous pygidium of the male. In Kingsolver et al. (1977: 115) *R. oedipygus* was listed as *R. sp. E*.

PICTURATUS GROUP

Pronotum with slight medial tumescences and prominent subbasal tumescences; elytra and pygidium with prominent pattern; pygidium sexually dimorphic with darkened depressions in female.

Discussion.—The four known species in this group are quite closely related. Color patterns on the pronotum and elytra are comparatively uniform for each sex of the four species. Sexual dimorphism in pygidial patterns is quite striking and offers excellent distinguishing features. Characters given in the key should be sufficient for identification but they are reiterated here for convenience.

Rhipibruchus psephenopygus is easily separated by the dark median, transverse band extending nearly or completely across the middle of the elytra (Fig. 30), and by the uniformly distributed pygidial vestiture in both sexes (cf. *picturatus* below) (Figs. 33, 34) except for the dark, slightly depressed sublateral patches in the female.

Rhipibruchus atratus is distinctive in its contrasting black-and-white pronotal and elytral patterns (Fig. 25). The male pygidial pattern (Fig. 28) is quite similar to those of *picturatus* and *prosopis* but elytral color and pattern will serve to separate these three species. The pygidial pattern (Fig. 29) of females of *atratus* with strikingly contrasted large, black subapical patches margined medially by reddish brown hairs, and with dorsal patches of the same reddish brown is diagnostic.

Rhipibruchus prosopis is easily separated from others in the genus by the yellow vestiture of the elytra in both sexes. The pygidium in the female (Fig. 20) is distinctively marked with a basal triangular and narrow median line white, subapical marginal, depressed patches black, and the remainder of the vestiture yellow. The middle of the elytra is usually marked with a large, dark common spot (Fig. 19).

Rhipibruchus picturatus is most easily confused with *psephenopygus* but the pale areas on the elytra are more extensive with the dark spots disconnected and not forming a transverse band. The white basal triangle and white median line in both sexes of *picturatus* as well as the more prominent white

subbasal patches in the male (as in Fig. 28) and the more densely white "eyebrow" patches above the dark subapical depressed patches in ♀ *picturatus* (Fig. 13) are diagnostic.

Rhipibruchus picturatus (Fahraeus)

Figs. 12–18, 35

Bruchus picturatus Fahraeus, 1839: 2.

Megalorhipis leiboldi Philippi, 1859: 669.

Megalorhipis leyboldi: Pic, 1913: 12 (error).

Rhipibruchus picturatus: Bridwell, 1932: 105; Blackwelder, 1946: 758; Kingsolver, 1967: 320; Kingsolver et al., 1977: 115.

The redescription (Kingsolver, 1967) and the group diagnosis given above are sufficient to distinguish this species from others in the group.

Male genitalia (Figs. 14, 15).—Internal sac of median lobe with brush of setae short; spinous plate short, broad, with 4–5 spines; median cluster of 5 large, thornlike, curved spines and 3–4 smaller denticles; lateral lobes blunt apically, somewhat oblique on median margin, cleft to about ½ their length.

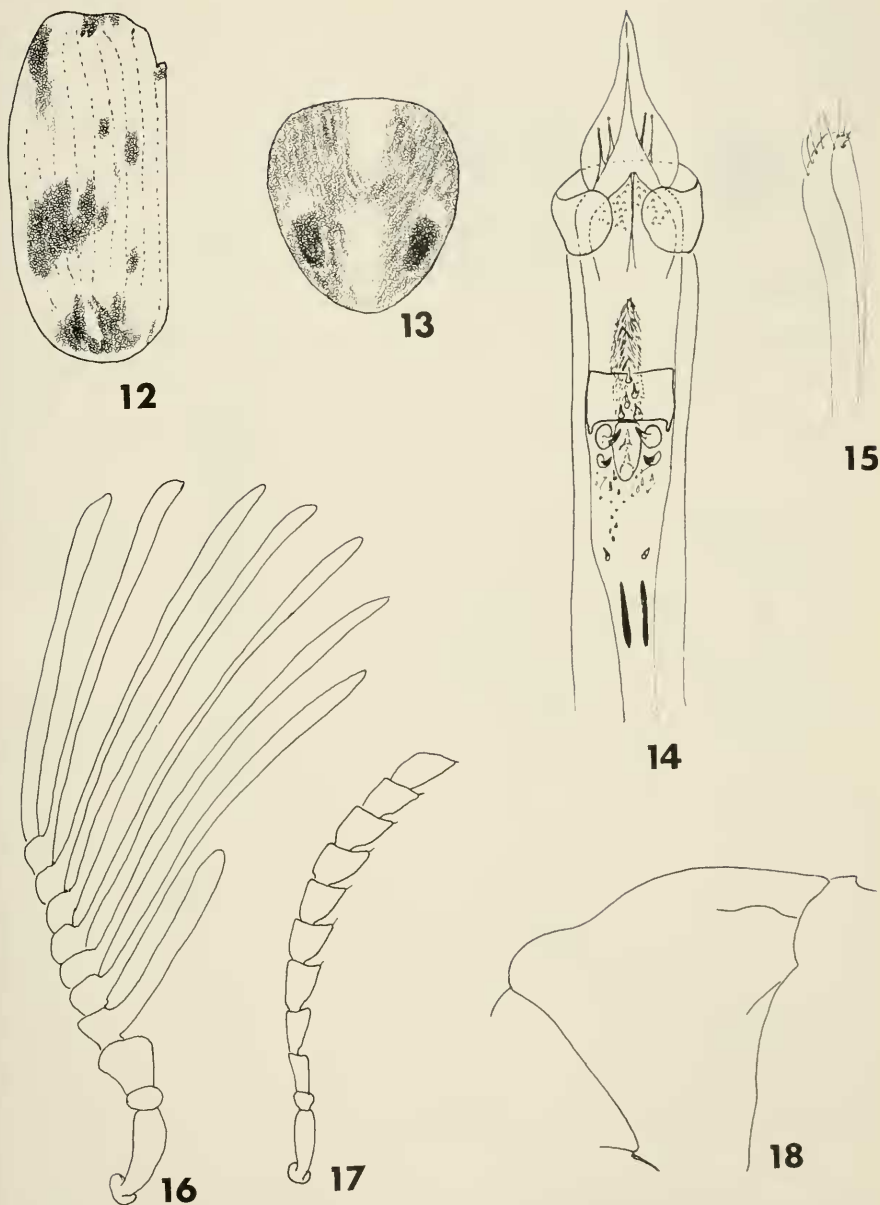
New host records.—ARGENTINA: Catamarca Prov., Rt. 307 6 km N Sta. Maria, 11 January 1980, in *Prosopis flexuosa*; 30 mi N Catamarca, ex seeds *Prosopis nigra*; Arauco, near Aimogasta, ex seeds *Prosopis chilensis*. Santiago del Estero Prov., Rt. 34, 31 mi SE La Banda, 12 June 1976, in *Prosopis alba*. La Rioja Prov., Aimogasta, 25 February 1978, in *Prosopis chilensis*; Rt. 9, 46 km N from Rt. 38, in *Prosopis chilensis*. Cordoba Prov., Rt. 38, Capilla del Monte, 22 February 1978, in *Prosopis alba*; Rt. 38, Camino a los Mogotes, 25 February 1977, in *Prosopis chilensis*; Rt. 7, 1 mi E. Cordoba-San Luis border, 19 November 1976, in *Prosopis caldenia*. Entre Rios Prov., Rt. 126, 9 mi NE La Paz, 15 March 1977, in *Prosopis nigra*. San Juan Prov., 3 mi E Caucete, 19 February 1978, in *Prosopis torquata*; Calingasta, 17 May 1977, in *Prosopis strombulifera*. Mendoza Prov., Rt. 40, Mojon km 19, 24 November 1976, in *Prosopis strombulifera*. San Luis Prov., Alto Pencosa, 6 February 1951; Lavaisse, Don Roberto Estancia, January 1943, 17 October 1942, February–March 1943; La Pampa Prov., Rt. 35, 85 mi N Sta. Rosa, 15 February 1978. CHILE: Santiago Prov., Antumapu, 11 June 1974.

Rhipibruchus prosopis Kingsolver

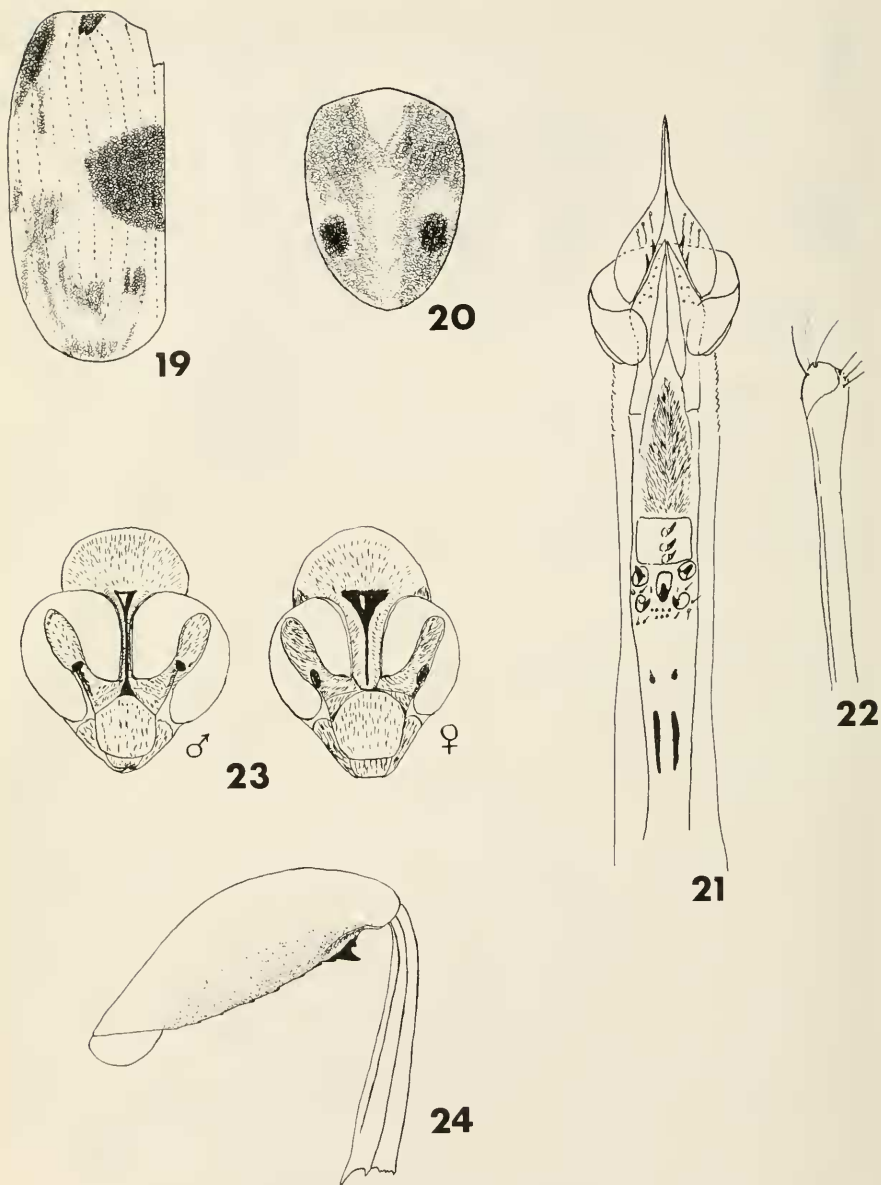
Figs. 19–24, 36

Rhipibruchus prosopis Kingsolver, 1967: 322; Kingsolver et al., 1977: 115.

The original description (Kingsolver, 1967) and the group diagnosis given above are sufficient to distinguish this species.



Figs. 12-18. *Rhipibruchus picturatus*. 12, Left elytron, integumental pattern. 13, Pygidium ♀. 14, ♂ genitalia, median lobe. 15, ♂ genitalia, lateral lobe. 16, Antenna ♂. 17, Antenna ♀. 18, Prothorax, lateral profile.



Figs. 19-24. *Rhipibruchus prosopis*. 19, Left elytron, integumental pattern. 20, Pygidium ♀. 21, ♂ genitalia, median lobe. 22, ♂ genitalia, lateral lobe. 23, Heads, ♂, ♀. 24, Metafemur and metatibia.

Male genitalia (Figs. 21, 22).—Internal sac with brush of setae moderately long; spinous plate short, broad, with 2–3 spines; median cluster of 5 large, curved, thornlike spines and 2–3 denticles; lateral lobes rounded apically, cleft to about $\frac{3}{5}$ their length.

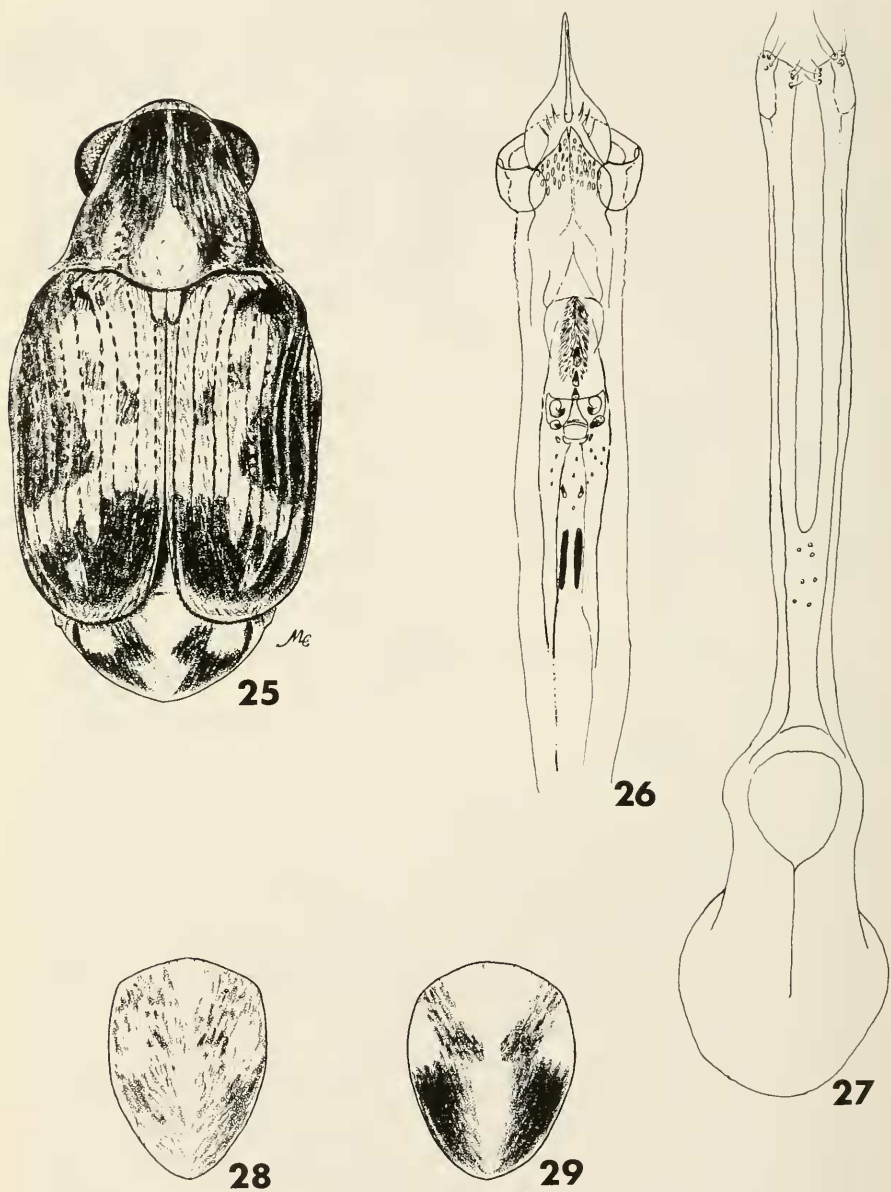
New host records.—ARGENTINA; Formosa Prov., Rt. 81, 15 mi NW Formosa, 10 December 1976, in *Prosopis nigra*; Rt. 81, 14 mi SE Cdte. Fontana, 12 March 1977, in *Prosopis kuntzei*. Catamarca Prov., Catamarca, 31 January 1970. La Rioja Prov., Aimogasta, 25 February 1978, *Prosopis chilensis*. San Juan Prov., Rt. 20, 1 mi SE Caucete, 19 February 1978, in *Prosopis alpataco* and *strombulifera*; Rt. 40, 18 mi NE Mendoza-San Juan border, 22 February 1977, in *Prosopis flexuosa*; Rt. 141, 12 mi S Calingasta, 16 May 1977, in *Prosopis calingastana*; Airport, Rt. 20, 10 km from San Juan, 26 November 1976, in *Prosopis strombulifera*. Cordoba Prov., Rt. 38, 8 mi NW Cruz del Eje, 24 February 1977, in *Prosopis chilensis*. Entre Rios Prov., Rt. 126, 9 mi NE La Paz, 15 March 1977, in *Prosopis nigra*. Mendoza Prov., Rt. 40, 8 mi NE Mendoza, 22 February 1977, in *Prosopis strombulifera* and *alpataco*; Rt. 40, Mojon, km 19, 24 November 1976, in *Prosopis strombulifera*; Rt. 40, 4 mi N. Mendoza, 19 February 1978, in *Prosopis strombulifera*.

Rhipibruchus atratus Kingsolver, NEW SPECIES

Figs. 25–29, 39

Body length.—2.9–3.1 mm; width, 1.5–1.7 mm. Pronotal length, 0.8–0.9 mm; width, 1.1–1.3 mm.

Color.—Integument reddish brown to black, head black except apex of clypeus and postocular spots reddish; antenna piceous; pronotum black except basal triangle and lateral and apical margins reddish; elytra (Fig. 25) with reddish-brown median vitta extending laterally to 5th or 6th interval and with subapical band extending to lateral margin, 3rd interval with subapical black spot grading to apical $\frac{1}{4}$ of elytra black, lateral margins black; venter of body piceous to black, abdomen often reddish; pro- and mesolegs reddish brown, darker proximally, metafemur piceous with dorsal reddish brown area; metatibia reddish brown, darker proximally; pygidium of ♂ reddish brown, with subapical lateral margins dusky; pygidium of ♀ dark red. Vestiture of black, dark brown, yellowish-brown, yellow, and white slender setae, those on head yellowish brown, on pronotum yellowish with narrow, median white stripe expanded basally, white often intermixed with yellow, darker areas of disk with dark brown hairs, flanks with yellowish and white; elytra with white or yellowish setae on reddish integument, and black with scattered intermixed white on black integumental areas; venter of body and legs evenly covered with white hairs; pygidium of ♂ (Fig. 28) densely covered with white hairs condensed into basal triangle and vague



Figs. 25-29. *Rhipibruchus atratus*. 25, Habitus, dorsal. 26, ♂ genitalia, median lobe. 27, ♂ genitalia, lateral lobes. 28, Pygidium ♂. 29, Pygidium ♀.

lateral patches, of ♀ (Fig. 29) with condensed basal triangle, median stripe, and basolateral patches of white hairs intermixed with yellow; apicolateral depressed, ovate spots with dark brown hairs.

Structure.—Body ovate, elytra quadrilateral, pronotum campaniform. Head subtriangular, eyes strongly protruding laterally, sexually dimorphic, relatively larger and more narrowly separated medially in ♂, ocular sinus narrow, extending about $\frac{4}{5}$ length of eye, vertex finely reticulate, frons narrow, strongly carinate, finely punctate, clypeus scabriculous, labrum semicircular, sparsely punctate, supraantennal ridges prominent, frons between ridges concave; ♂ antenna strongly pectinate, reaching metacoxa, in ♀ serrate from 4th segment, reaching humerus. Pronotum (Fig. 25) with basal margin strongly lobed, apical margin semicircular, lateral margins sinuate; disk strongly convex, shallowly sulcate either side of broad median gibbosity, this with shallow sulcus in basal $\frac{1}{2}$; obsolete subbasal gibbosity near each posterolateral angle, surface of disk densely microfoveolate, each foveola with a hair arising from its center or from its anterior rim; lateral carina present as an obsolete ridge extending to procoxal cavity; cervical sulcus short, fine; cervical boss small but distinct, bisetiferous; prosternum short, triangular, acute posteriorly, procoxae contiguous in apical $\frac{1}{3}$. Scutellum short, narrow, $2\times$ as long as wide, deeply bifid apically. Elytra (Fig. 25) slightly longer than wide, widest at basal $\frac{1}{3}$, disk moderately convex, subdepressed at basal, median $\frac{1}{3}$; striae slightly sinuate, 1 and 2 each arising from basal fovea, 3 and 4 arising from a prominent, minutely dentate, subbasal gibbosity, 5 arising laterad of gibbosity, striae 4 and 5 and 6 and 7 conjoined apically, remaining striae ending free; intervals flat, finely strigose, 3 and 5 wider than 2, 4, and 6. Mesosternum acute apically; post-mesocoxal sulci conjoined on midline, ending laterad of coxal cavity. Abdomen of ♂ telescoped, 1st sternum longer than remaining 4 together, 5th sternum with posterior margin shallowly emarginate and narrowly reflexed ventrad to receive apex of pygidium, of ♀, 1st sternum subequal in length to remaining 4 together, 5th sternum slightly tumescent in profile, perceptibly emarginate on posterior border; ♂ pygidium strongly reflexed, disk moderately convex transversely, surface finely, sparsely punctate, of ♀ not reflexed, disk convex with lateral darker areas subdepressed and finely, densely punctulate, white setae nearly concealing punctuation. Pro- and mesolegs not unusually modified; metacoxa densely, evenly punctate except for elongate, polished area near trochanteral insertion; metafemur moderately incrassate, more strongly arcuate on dorsal margin than on ventral, pecten with 1 long and 2 shorter distal denticles, metatibia slender, wider distally, mucro short, acute, lateral denticle prominent, 4 coronal denticles fine, lateral, ventral, and dorsomedial carinae distinct and complete, lateroventral carina obsolete in apical $\frac{1}{4}$.

Male genitalia (Figs. 26, 27).—Internal sac of median lobe with brush of setae short; spinous plate elongate, parallel-sided, with 4 spines; median cluster of 5 large, thornlike and 2–3 smaller spines; lateral lobes elongate, apices bluntly oblique, cleft to about $\frac{2}{3}$ their length.

Holotype ♂.—ARGENTINA: Formosa Prov., Rt. 11, 12 mi N. Chaco-Formosa border, 8 December 1976, in pods *Prosopis nigra*.

Allotype ♀.—Same data as holotype.

Other paratypes.—ARGENTINA: Catamarca Prov., Rt. 60, 47 mi SE Tinogasta, 25 February 1978, in seed pods, *Prosopis torquata*, 2 ♀; Rt. 307, 6 km N Santa Maria, 11 January 1980, in seed pods *Prosopis flexuosa*, 1 ♀; Rt. 62, 26 mi S Andalgalá, 1 March 1977, in pods, *Prosopis abbreviata*, 1 ♀; 50 km W Andalgalá, 31 October 1972, on *Cassia*, 1 ♂, 1 ♀; same data except in pods, *Prosopis flexuosa*, 1 ♀. Formosa Prov., Rt. 81, 15 mi NW Formosa, 10 December 1976, in pods on ground, *Prosopis nigra*, 2 ♂, 1 ♀. La Pampa Prov., Rt. 188, 38 mi W Realico, 15 February 1978, in pods, *Prosopis caldenia*, 1 ♀. La Rioja Prov., Rt. 20, 23 mi E Chepas, 20 February 1978, in pods on ground, *Prosopis torquata*, 1 ♀; La Rioja, January 1970, Peña, in *Prosopis abbreviata* 5 ♀. San Juan Prov., Rt. 20, 3 mi E Caucete, 19 February 1978, in pods on ground, *Prosopis torquata* 4 ♀; Matagusanos, 29 February 1970, 4 ♂, 6 ♀. Santiago del Estero Prov., Rt. 34, 31 mi SE La Banda, 6 December 1976, in seed pods, *Prosopis alba*, 1 ♀. San Luis Prov., Lavaisse, Don Roberto Estancia, 12 and 18 October 1942, 2 ♂. PARAGUAY: Pres. Hayes Prov., Hwy. Trans Chaco 365 km NW Asunción, 18 January 1976, DeLoach #72179, in pods, *Prosopis ruscifolia*, 1 ♂, 2 ♀.

Type and paratypes deposited in the Fundación Miguel Lillo, Tucumán; paratypes deposited in the National Museum of Natural History, Washington, D.C., Rivadavia Museum of Natural Sciences, Buenos Aires, Utah State University, Logan, British Museum (Natural History), London, and the Museo Nacional de Historia Natural, Santiago, Chile.

Diagnosis.—This species is easily recognized by the intensely black border of the elytra, the predominantly dark pronotum, and the strikingly marked pygidium. It is probably most closely related to *R. picturatus*. See the *picturatus* group diagnosis above.

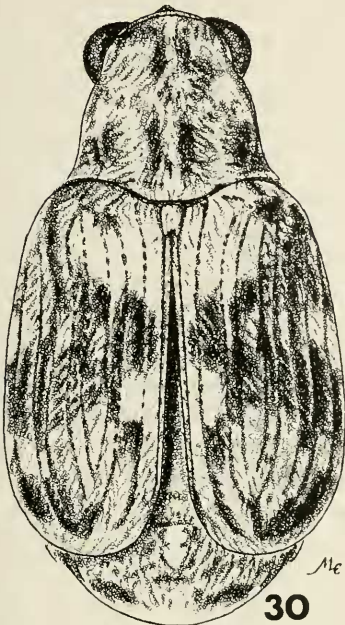
Remarks.—The name *atratus* is derived from the Latin *atratus* (dressed in black) and refers to the prominent black border of the elytra.

Rhipibruchus psephenopygus Kingsolver, NEW SPECIES

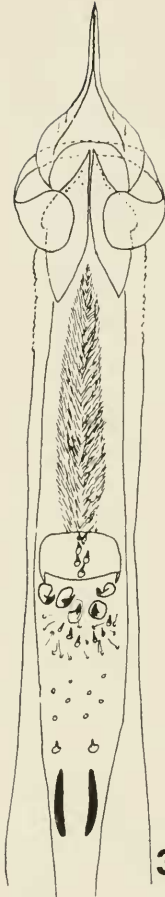
Figs. 30–34, 37

Body length.—2.2–4.3 mm; width, 1.4–1.9 mm. Pronotal length, 0.7–0.9 mm; width, 0.9–1.3 mm.

Color.—Integument yellowish brown to reddish brown or piceous; head piceous, clypeus and labrum usually reddish, head behind eye reddish, an-



30



31



32



33

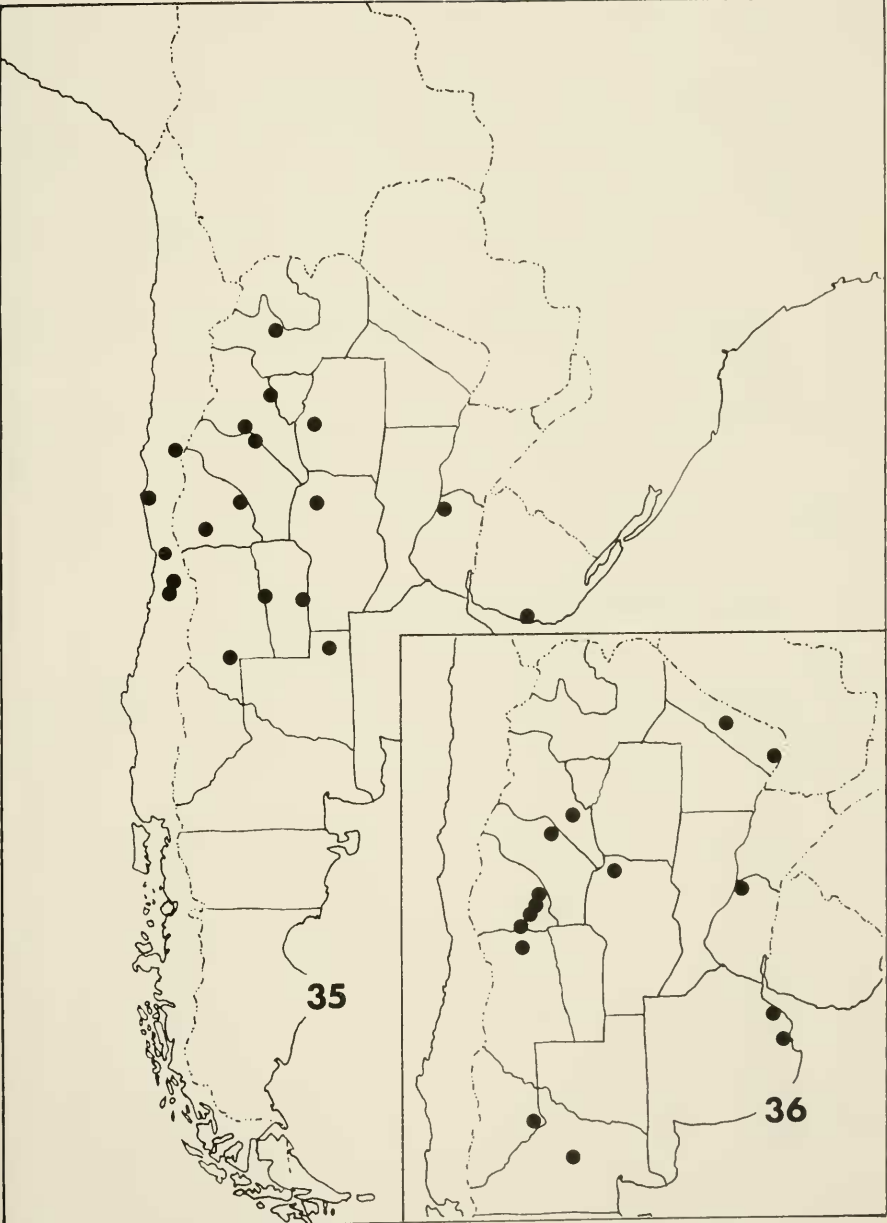


34

Figs. 30-34. *Rhipibruchus psephenopygus*. 30, Habitus, dorsal. 31, ♂ genitalia, median lobe. 32, ♂ genitalia, lateral lobes. 33, Pygidium ♂. 34, Pygidium ♀.

tenna dark reddish brown with segments 1 and 2 paler beneath, pronotum mostly piceous fading to reddish brown along anterior border and occasionally along posterior border; elytra with contrasting piceous and reddish-yellow to reddish-brown variable pattern with humeri and basal umbones darker, circumscutellar area reddish yellow to brown sometimes extended to surround umbones, median transverse band piceous divided laterally by paler blotch, this sometimes small or absent, apical $\frac{1}{2}$ of elytra usually with oblique pale band extending to lateral margins, apical $\frac{1}{3}$ variable from nearly all piceous to all mottled; venter of body piceous with some reddish areas especially on abdomen; legs pale reddish yellow except ventral $\frac{1}{2}$ of metafemur and base of metatibia dusky; pygidium uniformly piceous to black with depressed lateral spots of ♀ slightly darker. Vestiture of black, gray, and brownish hairs, paler areas of integument generally with gray hairs, piceous or reddish areas with brown or black hairs; head with brownish hairs, antenna with gray, pronotum with a broad, black median stripe divided by gray stripe and transversely bisected by grey band, sublateral stripe and flanks intermixed gray and brown, subbasal gibbositities piceous; scutellum gray; elytra with pale area gray, darker areas black with gray and brown intermixed; venter with evenly distributed gray hairs; ♂ pygidium (Fig. 33) with gray hairs nearly evenly distributed, some specimens with faint median gray line of hairs; ♀ pygidium (Fig. 34) with basal white triangle leading to intermittent median line of hairs, lateral depressed areas sometimes with black hairs intermixed with gray; legs evenly covered with gray hairs.

Structure.—Body ovate, base of pronotum narrower than elytral base (Fig. 30). Head subtriangular; ♂ eyes larger than ♀ eyes, ♂ frons narrow; ocular sinus narrow, about $\frac{3}{4}$ length of eye, carina above base of antenna prominent; vertex densely, finely punctate, frons strongly carinate arising dorsally as impunctate, triangular boss, clypeus broader in ♂ than in ♀, postocular fringe narrow; ♂ antenna strongly pectinate from 4th segment, ♀ antenna serrate from 4th segment. Pronotum (Fig. 30) campaniform, lateral margins slightly sinuate, disk strongly convex, with narrow median sulcus, and shallow longitudinal sulcus extending anteriorly from situation of basal margin, subbasal gibbositities prominent; surface of disk microfoveolate, each foveola bearing a hair at its anterior rim, interspaces micro-punctate; lateral carina fine in basal $\frac{1}{2}$, obsolete apically; cervical sulcus fine, short; cervical boss prominent, bisetiferous; prosternum short, acutely triangular medially, separating procoxae for only $\frac{1}{2}$ their length. Scutellum 2× as long as wide, bidentate apically. Elytra quadrilateral, slightly longer than wide, gently convex except subdepressed along suture, and more strongly depressed around scutellum; striae slightly sinuate, 1st stria arising near scutellum, 2nd arising in basal pit beneath oblique marginal ridge, 3rd and 4th arising from prominent, dentate subbasal gibbosity, 5th arising along



Figs. 35-36. Distribution of *Rhipibruchus* spp. 35, *R. picturatus*. 36, *R. prosopis*.

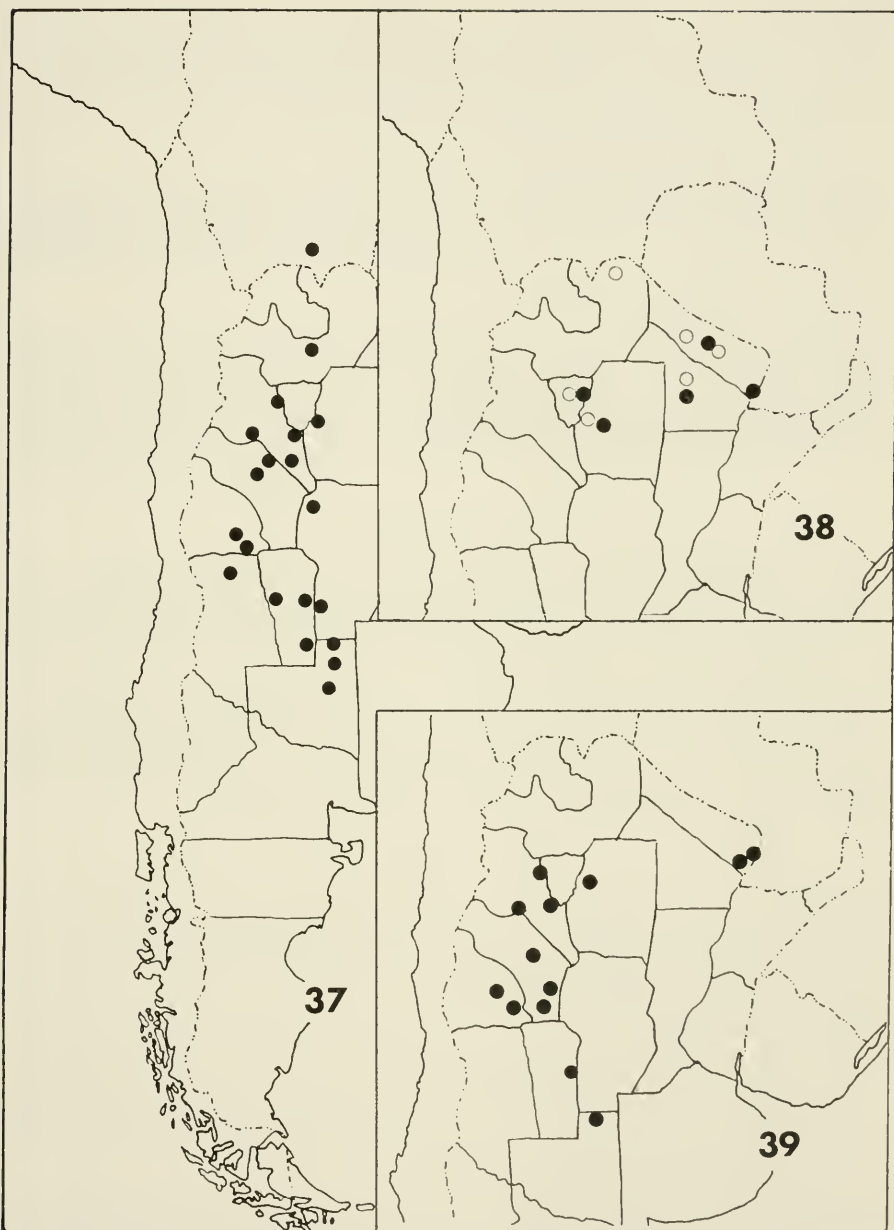
lateral border of gibbosity; strial punctures fine, elongated, closely spaced; 3rd, 5th, 7th, and 9th intervals slightly wider than 2nd, 4th, 6th, and 8th; intervals flat, finely strigose; mesosternum strongly narrowed apically, post-mesocoxal sulci fine, meeting on midline, inconspicuous behind coxae. Abdomen and pygidium as in *R. atratus*. Pro- and mesolegs not modified, metacoxa finely punctate except for narrow, polished sulcus; metafemur incrassate but narrow, dorsal margin more strongly arched in distal $\frac{1}{2}$ than proximal $\frac{1}{2}$, ventral margin nearly straight, pecten consisting of 2 or 3 short denticles, proximal denticle longer than distal denticles; metatibia slender, more narrowed at base, gradually broadening distally, mucro short, acute, lateral denticle small, coronal denticles fine, inconspicuous; lateral, ventral, and dorsomedial carinae fine but complete to apex, lateroventral carina obsolete in apical $\frac{1}{5}$.

Male genitalia (Figs. 31, 32).—Ventral valve of median lobe with elongated apex; internal sac with brush of setae nearly $\frac{1}{2}$ as long as sac; spinous plate short, broad, with 5–6 spines; median cluster with 5 large, thornlike spines and 3 smaller denticles; lateral lobes blunt apically, cleft to about $\frac{3}{5}$ their length.

Holotype ♂.—ARGENTINA: La Pampa Prov., Rt. 35, 1 mi N Santa Rosa, 18 November 1976, from pods *Prosopis caldenia*.

Allotype ♀, 3 ♂, 1 ♀ paratypes.—Same data as holotype.

Other paratypes.—ARGENTINA: San Juan Prov., Rt. 20, 32 mi SE Caucete, 19 February 1978, in *Prosopis alpataco* and *chilensis*, 2 ♂; Rt. 20, 3 mi E Caucete, 19 February 1978, in *Prosopis torquata*, 1 ♀; Rt. 20, 1 mi SE Caucete, 19 February 1978, in *Prosopis alpataco*, 1 ♂. Catamarca Prov., Rt. 62, 26 mi S Andalgala, 1 March 1977, in *Prosopis flexuosa*, 2 ♂; Rt. 307, 6 km N Santa Maria, 11 January 1980, in *Prosopis flexuosa*, 1 ♂; Rt. 40, 14 mi NE Tinogasta, February 1978, sweeping *Larrea cuneifolia*, 1 ♀; Andalgala, 23 October 1973, from *Prosopis nigra*, 1 ♂; Andalgala, 25 October 1972, 1 ♂; Colpes, 19 October 1973, from *Prosopis nigra*, 1 ♂. Santiago del Estero Prov., Rt. 34, 31 mi SE La Banda, 6 December 1976, in *Prosopis alba*, 1 ♀. Las Termas, 11 October 1972, *Prosopis alba*, 1 ♂; La Rioja Prov., Rt. 74, 1 mi SE Chilecito, 30 November 1976, on *Acacia aroma*, 1 ♂; Aimogasta, 11 February 1978, *Prosopis chilensis*, 4 ♂, 5 ♀, 25 February 1978, in *Prosopis chilensis*, 3 ♂. Cordoba Prov., Rt. 7, 1 mi E Cordoba-San Luis border, 19 November 1976, in *Prosopis caldenia*, 4 ♂; Rt. 38, 9 mi SW Cruz del Eje, 24 February 1977, in *Prosopis chilensis*, 1 ♂. Mendoza Prov., Rt. 40, 8 mi NE Mendoza, 22 February 1977, in *Prosopis alpataco*, 1 ♀. San Luis Prov., Rt. 188, 20 mi W La Pampa-S. Luis border, 15 February 1978, in *Prosopis caldenia*, 1 ♀; Rt. 188, 20 mi W La Pampa-S. Luis border, 17 February 1977, in *Prosopis flexuosa*, 1 ♂, 1 ♀; Alto Pencosa, 6 February 1951, 1 ♀. Lavaisse, Don Roberto Estancia, 17 Oc-



Figs. 37-39. Distribution of *Rhipibruchus* spp. 37, *R. psephenopygus*. 38, *R. oedipygus* (solid circles); *R. rugicollis* (open circles). 39, *R. atratus*.

tober 1942, 1 ♂; La Pampa Prov., Rt. 188, 38 mi W Realico, 15 February 1978, in *Prosopis caldenia*, 3 ♂, 4 ♀; Rt. 35, 85 mi N Santa Rosa, 15 February 1978, in *Prosopis caldenia*, 1 ♂, 1 ♀. Salta Prov., Oran Salta, 14–17 August 1917, *Prosopis juliflora*, 2 ♂. BOLIVIA: Tarija Prov., Tarija, 7 July 1980, in seed *Prosopis* sp., 1 ♀.

Holotype and paratypes deposited in Fundación Miguel Lillo, Tucumán. Allotype and paratypes deposited in National Museum of Natural History, Washington, D.C.; paratypes in Bernardino Rivadavia Museum of Natural Sciences, Buenos Aires, British Museum (Natural History), London, and Utah State University, Logan.

Diagnosis.—This species is recognized by the evenly distributed pygidial vestiture in both sexes and by the broad, transverse dark band across the middle of the elytra. It is probably most closely related to *R. picturatus*.

Remarks.—The name *psephenopygus* is derived from the Greek *psephenos* (dark, obscure) and *pyge* (rump) and refers to the dark pygidium.

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